

Effect of Consumer Perceptions of Web Site Brand Personality and Web Site Brand Association on Web Site Brand Image

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Abstract This study present a conceptual model linking web site brand personality and web site brand association to web site brand image. The model was estimated on data from consumers of online products from two countries, Spain and Scotland, using PLS technique.

1 Introduction

Brands are an important source of competitive advantage. Therefore, knowing how actual and potential clients perceive a brand is fundamental to inform its management. In brand theory, a brand is said to have attributes such as brand personality, brand association, and brand image to which brand knowledge is always linked [e.g., (Aaker 1991; Keller 1993, 1998)]. Some authors defend that the consumer-brand relationship depends largely on the successful establishment of the brand Knowledge (Keller 2003).

Brand Knowledge can be formed directly from a consumer's experience. Therefore, they might be crucial mediators between brand experience and consumer-brand relationship. If such a relation proves, understand the way these concepts interrelate with each other might be valuable to inform marketing strategy formulation, namely, in what concerns brand management.

The main goal of this paper is to test a model relating web site brand personality and web site brand association with the formation of web site brand image from an experiential view. The model was estimated on data from 195 consumers of online products from two countries, Scotland and Spain, using PLS technique.

To our best knowledge, this is the first time web site brand Knowledge (association, personality, and image) are addressed in such a way and the study differs from previous work which have related brand Knowledge of goods and services (Bart

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et al. 2005; Chang and Chieng 2006), sold through virtual stores (web site) or physical stores. Second, this study focuses on consumers experiences in two European countries with very different levels of Internet use for shopping. Given the paucity of cross-country studies in this area, using PLS might prove to be valuable to considerably advance existing knowledge and enhance current practices of web use for retailing.

2 Theoretical Background and Hypotheses

In this study we state that web site brand personality, web site brand association and web site brand image all hold different information that link to a web site brand (Aaker 1991). Furthermore, we assume that web site brand personality and web site brand association are important determinants of website image.

Brand image is defined here as perceptions about a brand as reflected by the brand associations held in consumer memory (Keller 1993). Brand personality is defined as the set of human characteristics associated with a brand (Aaker 1997). It is a comprehensive concept, which includes all the tangible and intangible traits of a brand, such as beliefs, values, prejudices, features, interests, and heritage. A brand personality makes it unique. Brand personality is seen as a valuable factor in increasing brand engagement and brand attachment, in much the same way as people relate and bind to other people. Researchers have proposed that brand personality is an aspect of brand image (Keller 1993, 1998; Plummer 2000) and results from empirical studies indicate that brand personality have a statistically significant positive influence on brand image (O'Cass and Lim 2001).

According to previous studies (Chang and Chieng 2006; Keller 1998), brand association is defined as the information linked to the node in memory. This information reflects an association between a range of aspects and the brand in the mind of the consumer. Brand associations have been presented as critical components in developing a brand image (Keller 1993) and empirical studies have shown that brands associations lead to the formation of a distinct brand image in the minds of consumers (Hsieh 2002). In this work, the above three concepts are transposed to the context of web site brand and we hypothesize that:

H1: Web site brand personality significantly and positively influences web site brand image

H2: Web site brand association significantly and positively influences web site brand image

3 Methods

The surveys were conducted in June 2008 through face-to-face interviews in universities of Spain and Scotland. We collected 95 completely filled questionnaires from students of Spain and 100 from students of Scotland. Each sub-sample has the

same average age of 24 years. The respondents were split almost equally in terms of gender for both countries.

Brand association was measured using two dimensions (product and organization) (Barclay et al. 1995; Carmines and Zeller 1979). Brand personality was operationalized using 5 dimensions (sincerity, excitement, competence, sophistication, and ruggedness) (Aaker 1997) and brand image with 3 dimensions (function, experience, and symbolic) (Chang and Chieng 2006; Keller 1993). Each statement of the questionnaire was recorded on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The questionnaire was built in English, translated to Spanish and then translated back to English in order to guarantee the content validity.

A structural equation model approach using Partial Least Squares (PLS) (Ringle et al. 2005) was employed to test the hypotheses of this study. PLS (Partial Least Squares) is based on an iterative combination of principal components analysis and regression, and it aims at explaining the variance of the constructs in the model. In terms of advantages, PLS simultaneously estimates all path coefficients and individual item loadings in the context of a specified model, and as a result, it enables researchers to avoid biased and inconsistent parameter estimates. Based on recent developments (Chin et al. 2003), PLS has been found to be an effective analytical tool to test interactions by reducing type II error. By creating a latent construct which represents the interaction term, a PLS approach significantly reduces this problem by accounting for the error related to the measures. In fact, PLS models are based on prediction-oriented measures, not covariance fit like covariance structure models developed by Karl Jöreskog (or LISREL program developed by Jöreskog and Sörbom).

LISREL estimates causal model parameters aiming at minimizing the discrepancies between the initial empirical covariance data matrix and the covariance matrix deduced from the model structure and the parameter estimates (Barclay et al. 1995). PLS seeks to maximize variance explained in constructs and/or variables, depending on model specification. In addition, LISREL offers a number of measures of overall model “fit” such as the X^2 goodness-of-fit (which are related to the ability of the model to account for the sample covariances). PLS does not possess these kind of overall fit measures, relying instead on variance explained (i.e. R^2) as an indicator of how well the technique has met its objective (Barclay et al. 1995). In spite of that, there are several fit indices available on PLS software (Ringle et al. 2005) such as communality and redundancy measures and Stone-Geisser’s Q^2 measure, which can be used to evaluate the predictive power of the model.

As a substitute to parametric global goodness of fit measures that are used in LISREL technique (Tenenhaus et al. 2005) proposes the geometric mean of the average communality (outer model) and the average R^2 (inner model) (going from 0 to 1) as overall goodness of fit (GoF) measures for PLS (Cross validated PLS GoF):

$$GoF = \sqrt{communality \cdot R^2} \quad (1)$$

Table 1 Measurements Results

Manifest Construct	LV Index Values	Item Loading	Composite reliability	AVE*
Spain				
Brand association	3.5		0.8441	0.7309
AS1:Product		0.9000		
AS2:Organization		0.8070		
Brand personality	3.2		0.8769	0.7039
PS1:Excitement		0.8490		
PS2:Sophistication		0.8660		
PS3:Ruggedness		0.8000		
Brand Image	3.3		0.8702	0.6915
IS1:Functional		0.7650		
IS2:Experience		0.8820		
IS3:Symbolic		0.8440		
Scotland				
Brand association	3.6		0.9542	0.9125
ASc1:Product		0.9550		
ASc2:Organization		0.9550		
Brand personality	3.2		0.8780	0.7063
PSc1:Excitement		0.8850		
PSc2:Sophistication		0.7870		
PSc3:Sincerity		0.8460		
Brand Image	3.2		0.8834	0.7164
ISc1:Functional		0.8290		
ISc2:Experience		0.8400		
ISc3:Symbolic		0.8700		

* AVE Average Variance Extracted.

4 Results

A PLS model should be analyzed and interpreted in two stages. First, the adequacy of the measures (see Tables 1 and 2) is assessed by evaluating the reliability of the individual measures and the discriminant validity of the constructs (Hulland 1999). Then, the structural model is evaluated.

All the loadings (Table 1) of reflective constructs approach or exceed 0.707, which indicates that more than 50% of the variance in the manifest variable is explained by the construct (Carmines and Zeller 1979), excepting for the construct brand personality. Sincerity and competence were eliminated from the Spanish sample. Competence and ruggedness were eliminated from the Scottish sample. Composite reliability was used to analyze the reliability of the constructs since this has been considered a more exacting measurement than the Cronbach's alpha (Fornell and Larcker 1981).

Table 1 indicates that all constructs are reliable since the composite reliability values exceed the threshold of 0.7 and even the strictest one of 0.8 (Nunnally 1978). The measures also demonstrates convergent validity as the average variance of manifest variables extracted by constructs (AVE) is at least 0.5, indicating that more variance is explained than unexplained in the variables associated to a given construct.

To assess discriminant validity the square root of AVE should be greater than the correlation between the construct and other constructs in the model (Fornell and Larcker 1981). Table 2 shows that this criterion has been met.

The structural results for Spain are presented in Fig. 1. All the path coefficients are found to be significant at the 0.001 level and all the coefficients signs are in the expected direction. In this study a nonparametric approach, named Bootstrap, was used for estimating the precision of the PLS estimates and support the hypotheses. Accordingly, 500 samples sets were created in order to obtain 500 estimates for each parameter in the PLS model. Each sample was obtained by sampling with replacement to the original data set (Chin 1998; Fornell and Larcker 1981). The results of this procedure support all the hypothesized relations. The model also demonstrates a high level of predictive power (R^2) as the modeled constructs explains 66.6% of the variance in the brand image. The overall goodness of fit (Tenenhaus et al. 2005) reveals a good fit.

Table 2 Discriminant Validity: square root of AVE and correlations of constructs

Construct	Correlations of constructs		
	Brand association	Brand Image	Brand personality
Spain			
AVE ^{1/2}	0.8549	0.8316	0.8390
Brand association	1.0000	0.7663	0.4448
Brand Image	0.7663	1.0000	0.5926
Brand personality	0.4448	0.5926	1.0000
Scotland			
AVE ^{1/2}	0.9553	0.8464	0.8404
Brand association	1.0000	0.7324	0.6732
Brand personality	0.7324	1.0000	0.6845
Brand Image	0.6732	0.6845	1.0000

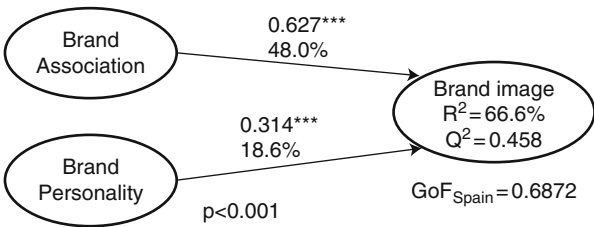


Fig. 1 Structural results (Spain)

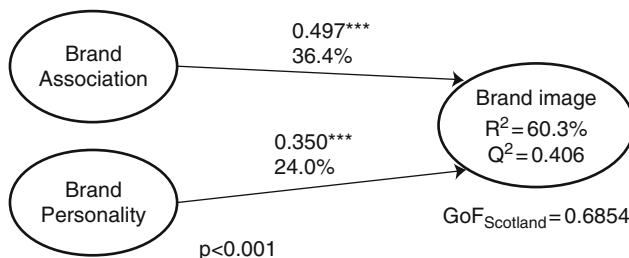


Fig. 2 Structural results (Scotland)

The multiplication of the Pearson correlation value for the path coefficient value of each two constructs reveals that 48.0% of the brand image variability is explained by the brand association.

The structural results for Scotland are presented in Fig. 2.

All the path coefficients are significant at the 0.001 level and all the coefficients signs are also in the expected direction. Like in the Spanish sample, the Bootstrap approach with $n = 500$ was used and all the hypothesized relations were supported. The value of Q^2 is positive attesting that the relations in the model have predictive relevance. The model also demonstrates a high level of predictive power, as the modeled constructs explains 60.3% of the variance in the brand image and the overall goodness of fit proposed also reveals a good fit. The multiplication of the Pearson correlation value for the path coefficient value of each two constructs reveals that 39.4% of the brand image variability is explained by the brand association and that 24.0% is explained by the brand personality.

Finally, the differences between the Scottish and the Spanish samples are compared using a t-test of $m + n + 2$ degrees of freedom (m = Spain sample size and n = Scotland sample size). This test uses the path coefficients and the standard errors of the two structural paths calculated by PLS with the samples of both countries, using the following expression:

$$t = \frac{(\beta_{Spain} - \beta_{Scotland})}{S_p \times \sqrt{\left(\frac{1}{m} + \frac{1}{n}\right)}} \quad (2)$$

$$S_p = \sqrt{\left[\frac{(m-1)^2}{(m+n-2)} \times SE_{Spain}^2 + \frac{(n-1)^2}{(m+n-2)} \times SE_{Scotland}^2 \right]}$$

The t-test results (Table 3) show that there are not statistically significant differences between the two countries in any of the two structural paths (at critical $t - value = |1.960|$).

Table 3 Multi-group Analysis Results

Structural paths	Standard error Spain	Standard error Scotland	Sp ¹	$\beta_{\text{spain}} - \beta_{\text{scotland}}$	t-test
Brand association → Brand image	0.0974	0.0922	0.9306	0.1299	0.0014
Brand personality → Brand image	0.0898	0.0983	0.9273	-0.0362	-0.0004

¹Unbiased estimator of average error standard variance

5 Discussion

This study is the first attempt to consider the web site brand in a structural model using PLS approach, which analyze simultaneously the causal order between web site brand association and web site brand image and between web site brand personality and web site brand image.

The results show that web site brand association and web site brand personality are good predictors of web site brand image and that the two hypotheses are confirmed for the Scottish and the Spanish samples. However, competence and ruggedness were eliminated from the Scottish sample and sincerity and competence were eliminated from the Spanish sample. The differences between the two countries are not statistically significant but the way students see web site brand personality might depend on the country culture. This area should be the object of further investigation.

Traditionally, brand image and brand personality are different constructs. However, PLS technique seems to evidence some correlation between the competence (eliminated in this analyze) of brand personality and the symbolic part of brand image.

Further directions for future work have been pointed out by this first study of web site brand knowledge. The model is being redesigned to include other constructs and we are planning to extend our research to other countries, such as Brazil, USA, Germany, Portugal and Poland. With a cross-country approach we will be able to analyze the impact of culture on consumers' perception and test the effect of globalization, advancing existing knowledge and generating valuable information to decision makers, marketers and web designers.

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